Intermediate Programming
600.120
Sections 03 and 04
Introduction
Department of Computer Science
Johns Hopkins University
The Course This Year

• We have built a larger capacity
  – A lot of people want to take the course
  – Can only have 30 students in a class
    • Interactivity
  – Decided to run the course four times this semester
    • Up from three times two years ago, twice four years ago, and once before that
    • Sections 03 and 04 are taught by Yair Amir and Amy Babay
    • Sections 01 and 02 are taught by Ben Mitchel following a different course plan
    • Both versions of the course share the same goal: programming should not be a barrier for students who pass the course.
  – Built a special classroom for this course in MD 310
Course Overview

Week 1

http://www.dsn.jhu.edu/courses/cs120/
cs120-help@dsn.jhu.edu
Course Information

• Lecture:
  – 03 Tuesday, Thursday 3pm – 4:15pm  MD 310
  – 04 Tuesday, Thursday 4:30pm – 5:45pm MD 310

• Tutorial:
  – 03 Friday 3pm – 4:15pm  MD 310
  – 04 Friday 4:30pm – 5:45pm MD 310
  – At times we will use 1 on 1 meetings instead

• Instructors: Yair Amir and Amy Babay
  – Office hours Yair : Malone 209 Tuesday 6pm – 7pm
  – Office hours Amy: Malone 209 Wednesday noon – 1pm
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  – Office hours Yair: Malone 209 Tuesday 6pm – 7pm
  – Office hours Amy: Malone 209 Wednesday noon – 1pm

• Teaching Assistant: Emily Wagner
  – Office hours: Malone 209 Monday 10:30am – 11:30am

• Course Assistants:
  – Trevor Aron, Sam Beckley, Ned Duhaime, Rachel Kinney, Matthew Richard, Sayge Schell

• E-mail contact to all of us: cs120-help@dsn.jhu.edu
• Course mailing list: www.dsn.jhu.edu/mailman/listinfo/cs120-2015
Course Books


• C++ How to Program, Deitel & Deitel, Prentice Hall. Editions: 5th, 6th … 9th – a couple versions are available online for Hopkins students.
  (this book will only be needed just before the middle of October).
Grading Policy

- 4 credit course.
- Projects – 4*12% = 48%
- Mid-term – 15%
- Final Project – 25%
- Attendance – 12%

- Ethics code: standard CS code www.cs.jhu.edu
- Zero tolerance for ethics problems.
  - We invest a lot and expect a lot in return.

Programming language: C and C++.
Need to get an account on the ugrad machines!
Tentative Plan

• Introduction, C - getting started. Week of Aug 27
• C - program structure, scope, pointers, structures, memory management. Week of Sep 3
  – Project 1 (Sep 4).
• C – basic development environment, example. Week of Sep 8
  – Project 2 (Sep 15).
• C – I/O / standard library. Week of Sep 15
• C - probabilistic data structure. Week of Sep 22
  – Project 3 (Sep 22).
• C - Project design. Week of Sep 29
  – Dry Run – Oct 2, Mid Term – Oct 6
Tentative Plan

• C++ - getting started.  Week of Oct 8.
  – Project 4
• C++ - Overloading.  Week of Oct 22 – 27.
• C++ - Inheritance, polymorphism.  Week of Oct 29.
• C++ - Templates.  Week of Nov 5.
  – Final Project (Nov 10)
• C++ - Project design.  Nov 17-19.
• A bit on research.  Nov 20.
• Intro to STL.  Week of December 1.
• Course summary.  Dec 4.
• Presenting and discussing design - scheduled.
• Solving problems - mostly unscheduled:
  – When stuck on implementation – try for 15 minutes.
  – Contact us immediately after that – come to Malone 207 or e-mail cs120-help@dsn.jhu.edu.
  – NEVER WASTE MORE THAN 15 minutes on a technical problem.
• Run ideas / designs by us – mostly unscheduled
  – Make a habit to consult with us at least once for every project, preferably long before submission deadline.
Team Work

Sayge

Ned

Amy

Yair

Emily

Sam

Trevor

Rachel

Matthew

Yair Amir & Amy Babay

Fall 15 / Week 1
A little about Yair

• Joined Hopkins 20 years ago
• Director of the Distributed Systems and Networks lab
  – www.dsn.jhu.edu
• Became department chair this past June
• First decade: taught high level courses:
  – Distributed systems, advanced distributed systems and networks, operating systems
• Fall 05, Spring 06, Fall 07, built a “new” Intermediate Programming course
  – Liked it! Asked to teach it again Fall 11, Spring 12 (twice)
  – Liked it even better – Fall 13, Spring 14 (three times but with Amy)
  – Still liking it 😊
• Enjoy inventing algorithms and software tools that enable the scalability, availability and security of the Internet infrastructure and distributed systems:
A little about Amy

• Started as an undergrad at Hopkins in 2008
• Interests/Major evolved over time
  – Undeclared ➔ Classics (minor) ➔ Cognitive Science (BA) ➔ Computer Science (MSE, PhD in progress)
• Took Intermediate Programming in Fall 2011
  – Liked it! CA in the spring + more CS classes
  – Liked those too – decided to stay for a Masters
  • Worked on high performance group communication and on consistency in big-data applications
• Currently 2\textsuperscript{nd} year PhD Student in the Distributed Systems and Networks (DSN) lab
  – Working on dependable infrastructure – particularly reliable, very low-latency wide-area messaging
A little about Emily

• Started as an undergrad at Peabody Conservatory in 2011 - Jazz Guitar/Recording Arts
• Transferred to Johns Hopkins Krieger School in Fall 2013
  – Graduated in May 2015 (Physics BS, minor Mathematics)
  – Undergraduate research in observational cosmology instrumentation
• Took Intermediate Programming in Fall 2013
  – Liked it! CA’d in the spring
  – Took several more CS courses over the next year and a half and wanted to learn more than 2 years at Hopkins would allow, so…
• Currently 1st year Masters Student exploring research topics in the DSN lab
Point of View: Where High Tech is Going

• The world has changed:
  – Infrastructure is cheap => low entry price
  – A networked world => most software can be done anywhere
  – Result: Global competition

• Two paths to win:
  – To be the cheapest among equals
    • This is not likely to happen here
  – To provide value nobody else can
    • Combination of leading-edge knowledge and strong skills

• Anything in between will be squeezed

• Exponential curve of quality/reward:
  – Exponential curve is great on the right side
  – … and deadly otherwise
Getting to the Right side of the Curve

• A combination of Leading-edge knowledge and strong skills
• We have excellent infrastructure for building leading-edge knowledge
  – Leading research groups
• But skills were lacking:
  – In the past, many students got to 300-400 level courses lacking strong programming foundation
  – This limited their ability to extract the full benefit of these top-notch courses
• So, we wanted to develop these skills early
• Higher expectations early => better tools to get to the right side of the curve later

• This is why we teach this course this way